

Stopping The Industrial Hydra: Revolution Against The Megamachine



This pamphlet was first published in the american radical ecological journal 'Fifth Estate' after the Exxon Valdez Oil spill. It describes first the spill itself before moving on to a wider analysis of the way that industrial interests can exploit even the disasters that might seem to undermine them and warns that in many cases environmentalists are acting as mere salesreps for industry. This incisive and rather scary analysis is backed up heavily. It also explains how industry creates needs for itself and looks at the limits of both environmentalism and leftism. Its impressive explanation of petrochemical civilisation and its often false oppositions is especially relevant considering this years west Wales oil spill- which released around twice as much oil as the valdez.

This essay has been printed as a discussion document by South Downs Earth First! for the '96 EF! summer gathering. A second edition will soon be available from South Downs EF!, Prior House, Tilbury Place, Brighton, E.Sussex. Send loads of money cos we have none.

Introduction

This pamphlet starts with a description of the sheer weight of death resulting from the Exxon Valdez spill and the even greater weight of company propaganda that followed quickly after.

The West Wales oil spill from the Sea Empress (!) in February released at least 72,500 tonnes compared that against 38,000 tonnes spilled in Alaska in 1989 by the Exxon Valdez. Yet to hear the PR men talk you would believe the disaster hadn't happened - one even went as far as to say so on channel four news. No fundamental questioning of petrochemicals was allowed to grace TV screens merely experts arguing about the validity of double hulls. One journalist who tried to research a piece properly - a task that took days rather than hours - shock! - was told by the Times only a week after the spill that it just wasn't news anymore. Meanwhile death continued.

Six weeks after the tanker ran aground the wildlife toll was still mounting, and oil in one form or another was still covering the beaches and drifting at sea - affecting 180km of coastline from Skomer Island to the Burry Inlet. A spell of mainly easterly winds pushed much of the oil well offshore, with oiled seabirds, tar balls and debris reaching parts of south eastern Ireland. It is estimated that at least 70,000 birds have died(1). In many people's mind the disaster didn't happen. Beyond the media friendly pictures of oiled seabirds is a greater disaster. Much of the base of the area's oceanic food chain simply no longer exists. As one wildlife trust worker replied when a BBC news reporter asked what the situation on the ground was he said 'Everything's dead', after being accused of exaggeration he replied 'ok, not everything's dead, but everything that isn't is in the process of dying'.

However as this pamphlet argues it is not these spectacular disasters that are the real ecological threat - but the daily continu-

ance of normal life. This idea was recently brought up by John Vidal who stated 'Up to 50,000 barrels are deliberately spilled a year round the world by ships cleaning out their bilges. Accidents, say industry watchers, account for only 10 % of oil spills' (2).

It is every aspect of daily life that we have to question and challenge if we are to truly create a livable future. This pamphlet has been published as part of that process.

Sections and comments have been added into the text by an activist from South Downs EFI they are printed in a different font like the one used for this paragraph.

This edition has been rushed so that we could bring it to the Summer '96 EFI gathering. We will be printing a second edition soon which will include an in-depth look at the West Wales oil spill and the way the companies and the environmental movement reacted to it. It will have lots of exciting pictures too!

This and many other useful texts and amazing articles can be found on the Dead Trees EFI Web page <http://www.hrc.wmin.ac.uk/campaigns/efi/htmls/deadtrees.html> or we can email versions free if you ask us nicely at: savage@easynet.co.uk and remember smash your computer (not ours!!!)

(1) BBC Wildlife, May 1996

(2) Guardian, 'Crude Claims the Blur the picture', Feb 21 1996

1994, p.21.

23. 'Roads Take Toll', EFi Journal, Brigid 1996.

24. National Collation of the 1989 Aggregate Minerals Survey, DoE 1991, quoted in 'Wheeling Out of Control', CPRE Sept. 1992.

25. See 'Blasts from the Past', RSNC report, November 1992 and 'Old rights threaten ancient landscapes', Observer 14/2/93. The fate of Carmel Woods in Dyfed is an important test case for IDOs - and hopefully its future may have been secured.

26. 'Breaking The Silence', Geographical Magazine October 1993.

27. Zande et al. 1980, quoted in 'Trends in Transport and the Countryside', Countryside Commission 1992. See also Reijnen et al. in the Journal of Applied Ecology, 1995 - their research identified road noise as probably the most important cause of a reduction in the breeding densities of a variety of woodland bird species adjacent to main roads.

28. 'Road Traffic and the Countryside', Countryside Commission Position Statement July 1992. See also 'Trends in Transport and the Countryside' for more detailed workings.

29. From 'Autogeddon', Heathcote Williams, Jonathon Cape 1991.

30. See (e.g.): 'Roads Take Toll', EFi Journal Brigid 1996; 'Dirty From the Cradle to the Grave', Guardian 30/7/93; 'Wrong Side of the Tracks', TES, quoted in 'Ban Cars'; and Dr. Neil Ward's (Surrey University) research into run-off from the M25.

31. See 'Tire Dust Kills', Paving Moratorium Update Summer 1995.

32. 'Dying From Too Much Dust', New Scientist 12/3/94.

33. John Emsley, quoted in 'Ban Cars'.

34. 'The Environmental Impact of the Car', Do or Die no.1, Jan.1993. See also 'The Practical Science', James Lovelock, p.179. Presumably, if these CFCs have been phased out under the 1987 Montreal Protocol, they have been replaced (as has typically been the case) with HCFCs, different ozone-destroyers.

35. 'Ban Cars', p.17.

36. See 'Dirty from the Cradle to the Grave', Guardian 30/7/93.

37. 'Under Fire: Environmental Threats and the Extinction of the World's Cetaceans', Environmental Investigation Agency May 1994, p.8.

38. 'Extinction: The PCB Threat to Marine Mammals', Cummins, The Ecologist vol.18, no.6 1988, p.194.

39. 'Under Fire', p.8.

40. The Ecologist, p.193. Marine mammals are especially susceptible to PCBs because of the process of 'biomagnification'.

41. 'Dear Motorist - The Social Ideology of the Motorcar', André Gorz, reprinted from 'Le Sauvage', Sept-Oct. 1973.

42. Eg. Detroit dragging its heels over compliance with California's zero-emission programme.

43. 'Flat Out for the Car of the Future', New Scientist 7/11/92.

44. New Scientist 25/11/95.

Chernobyl, we must also consider the systemic failure on an ecospheric scale as the result of industrialism as a totality on the living system of the earth.

8) See "Revolution and Famine" in *Act for Yourselves*, Freedom Press. Presumably many anarcho-syndicalist defenders of industrialism will object, furnishing quotes from Kropotkin in which the anarchist prince reveals the optimism towards technology so common in his time. There will always be those who insist on overlooking what is most visionary and far-seeing in writers like Kropotkin while clinging to what has not withstood the test of historical experience. The myth of progress has become the real dead weight of the past" weighing like a nightmare on the imagination of the present.

Footnotes for 'Never Trust a techno-Fix'

1. For an elucidation of the concept of the carbon debt, and the role that it played in the deliberations of the Intergovernmental Panel on Climate Change (IPCC), see *The Terra Firm* no.5, 'The Great Carbon Emissions Fraud', Mundi Club, undated.
2. Council for the Protection of Rural England in *The Times*, 16/10/92.
3. 'Earth', the Ehrlichs, quoted in 'Ban Cars'.
4. 'Dear Caltrans', Jan Lundberg, quoted in *ibid*.
5. *The Guardian*, 30/8/93.
6. Ian Breach, quoted in 'Ban Cars'.
7. 'The Environmental Impact of the Car', Greenpeace, quoted in *ibid*.
8. *Guardian*, 10/5/95. There is little likelihood of a more advanced, non-lead battery emerging in the foreseeable future - see 'Paler Shade of Green', *Guardian* 18/1/94. Even if there were, any battery would still be composed of highly toxic elements.
9. 'Flat out for the Car of the Future', *New Scientist*, 7/11/92.
10. 'Getting From Here to There', David Morris, quoted in 'The Geophysical Threats Posed by Green Cars', Mundi Club Special Publications no.8, Mundi Club, undated.

11. 'Disposing of the Waste Trade', *The Ecologist*, March/April 1994.

12. For some recent figures on animal casualties, see *The Times*, 6/1/96.

13. 'Trends in Transport and the Countryside', Countryside Commission Technical Report 1992. See: 'The Eternal Threat: Biodiversity Loss and the Fragmentation of the Wild' in *Do or Die* no.5, September 1995. See also the research by English Nature on the effects of fragmentation on populations of stonechats and Dartford warblers, quoted in 'Transport and Biodiversity', RSPB Report 1994. One would have thought that birds have a greater capacity to transcend the effects of fragmentation than most animals, so if it has this kind of impact on them

14. 'Livable Streets', Donald Appleyard, University of California Press 1981, quoted in *The Guardian* 5/11/93, and 'Critical Mass - Reclaiming Space and Combatting the Car', *Do or Die* no.5.

15. 'Ancient Futures: Learning from Ladakh', Helena Norberg-Hodge, Rider 1992.

16. 'Dirty From the Cradle to the Grave', *Guardian* 30/8/93.

17. Snapping at the heels of the Darien Gap rainforest in Panama, and, presumably, connected to NAFTA and the ultimate vision of a trading bloc of the Americas. See also the Trans-Amazon Highway, Northern Brazil's road to the Atlantic coast via Guyana, and the BR364 through Chico Mendes' state of Acre, Brazil. (*New Statesman & Society*, 23/11/90.)

18. In Indonesia's occupied province of Irian Jaya/West Papua - in part, intended to strengthen Indonesia's campaign against the OPM guerillas.

19. Helping to construct Europe as a single market for production, distribution and consumption - e.g. see the plans of the European Round Table of Industrialists in various ASEED reports.

20. *New Scientist*, 30/4/94 - presumably presaging an expansion of the EU trading bloc to encompass North Africa.

21. 'Dear Caltrans', Jan Lundberg, quoted in 'Ban Cars'.

22. 'A Short History of the Wolf in Britain', James Harling, Pryor Publications facsimile

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1. Autopsy of a Petrochemical disaster

Remember the Exxon Valdez? The ship was the source of the worst oil spill to date in US history, spilling 11 million gallons of oil in Alaska's Prince William Sound, where it ran aground in March 1989. By the time it had limped into San Diego Harbour in July, it also left at least one other slick some eighteen miles long off the California coast.

The spill at Prince William Sound was the grand prize in a season of spills. In December 1988, 230,000 gallons of oil were spilled, fouling 300 miles of coast in the Canadian-US Pacific Northwest. (1) In January 1989, an Argentine ship broke apart, spilling 250,000 gallons of oil off Antarctica's Palmer Peninsula near penguin, seal and seabird colonies. In the four months prior to the Valdez disaster, Alaska suffered several spills, including a 52,000 gallon spill at a Kenai refinery, a city pipeline rupture that spilled jet fuel into a creek in Anchorage, and a ship grounding in Dutch Harbour that closed down fish plants temporarily and killed more than 500 birds. In January alone, the environmental organisation Greenpeace recorded six ship, barge and boat wrecks in Alaskan waters "that released or threatened to release large quantities of oil." One accident dumped 2 million gallons of diesel fuel into the ocean. (2) Then, in February, Exxon leaked 117,000 gallons of oil in Hawaii. Again, in April, another 10,000 gallons of oil from a mystery spill

fouled beaches on the Hawaiian islands of Molokai and Lanai. Later in the spring, over 300,000 gallons were spilled in the Delaware River, another 420,000 gallons were spilled in Rhode Island's Narragansett Bay, and the collision of a tanker and a barge in Texas's Houston Channel dumped 252,000 gallons of oil.

Still remember the Valdez? In a petrochemical civilization, oil and chemical spills go with the territory. Nevertheless, life - or rather, organised death - goes on as usual. The refineries, mines and factories continue to operate, and the traffic continues to roar relentlessly. Oil spills have now - with only sporadic exceptions - dropped out of the mass media, replaced by "crime" and "drugs" America's number 1 problem." As the apparatus turns, its media machine churns. The oil spill in Prince William Sound has become yesterday's newspaper, entering the exterminist Hall of Fame, along with others, such as the Santa Barbara off-shore oil rig spill in 1968, the sinking of the Amoco Cadiz off of Brittany in 1978, and the Ixtoc oil well spill off Mexico's Caribbean coast in 1979, as well as Bhopal, Love Canal, the Rhine River, Three Mile Island and Chernobyl, and on and on - a toponymy of extinction. As the hustlers say, pick a card, any card.

Survival, increasingly diminished and constrained, goes on, leaving an array of victims in its wake to pick up what little they can salvage. Everyone else adjusts to the increasing velocity of Progress, putting the wrenching and infuriating media images of dying animals behind

them. They still have to get to work, to play, and to Grandma's house, which is invariably on the other side of Hell six dozen freeway interchanges away. A few pious calls to drive less are heard, but in the absence of a mass strike today against the Machine, everyone keeps driving. The tyranny of mechanized daily life remains intact, and, in fact, is extended by the disasters it unleashes.

Not Just Another Accident

Nevertheless, the Valdez spill should not be denied its uniqueness. In magnitude and in terms of the rich ecosystem in which it occurred, it was exceptional. It occurred in an area containing one of the richest concentrations of animals in North America; 219 separate species of birds alone have been recorded in the Sound. Situated at an important point in the Pacific migratory route of Northern latitude breeders, the spill happened just in time to greet millions of birds on their way back north.

From late April to mid-May, the nearby Copper River delta is the world's largest resting area for shore birds, many on their way to nest in the Canadian Arctic. Flocks of as many as a hundred thousand birds stop two or three days to feed, foraging in shallows and at the water's edge, where much of the oil accumulates.

Almost the entire population of certain species pass through the area, for example, 20 million western sandpipers and dunlins alone. It is also rich with hundreds of thousands of black turnstones, tens of thousands of lesser golden plovers, red knots and whimbrels, and thousands of oystercatchers, ruddy turnstones, puffins, tundra swans, Canada geese, snow geese, gulls, cormorants, fifteen species of ducks, peregrine falcons and other birds. Some five thousand bald

eagles - the largest concentration in the world - are found in the area. As of September, some 146 eagles were found dead; as many as 70% of mothering eagles abandoned their nests, leaving behind oil-soaked eggs and dead chicks.

The world's largest concentration of northern sea otters, some ten to twelve thousand, were also found in the Sound. Probably half died from the spill, but many more are at risk. The effects on seals, whales and walrus are not clear, although they have not been affected as dramatically as the otters. While many animals have been killed by asphyxiation and freezing (one drop is enough to destroy protective coverings on birds and otters and kill them), not much is known about the toxicity of seawater contaminated by oil. Sitka black-tailed deer, feeding on the kelp along the beach, and bears feeding on carrion left by the spill, have died. Deadly chemicals found in oil such as xylene, benzene and toluene not only damage the intestines of large animals and kill them, but threaten the entire food chain by killing and disrupting the zooplankton on which it rests.

Fish such as herring, salmon and shellfish will be adversely affected as well. All in all, some 400,000 animals may have been affected. About 33,000 birds and 980 otters were found dead by official counts, but biologists consider such a number to be only ten to thirty percent of animals poisoned by the spill.

The long-term consequences on the marine ecology are, as is to be expected, also disastrous. Little has been known until fairly recently, but a study by the Smithsonian Tropical Research Institute in Panama, describing the biological consequences of a major oil spill in the Caribbean Sea off Panama in 1986, found "dramatic effects" both more severe and longer lasting than previously thought. Judging from laboratory tests, scientists

water's still clean." One can only wish him luck. But like the birds that once more headed south through Prince William Sound only to face poisoning again, we've all run out of places to hide. If the anti-industrial perspective now seems too radical, too visionary, too impractical, future generations, if there are any, will wonder why it took so much time and anguish to recognise it and to make it a practical reality. It remains as yet only a weak approximation of the road that lies ahead of us if we are to save some remnant of ourselves and this planet from the catastrophe whose engines were set in motion long ago. Let us begin to throw off our chains and win back the world while there is still something left of it to win.

-George Bradford, September 1989

Footnotes to Main Article

1) For an excellent essay on the Pacific Northwest spill, see Mikal Jakubal's "With Enough Toothbrushes" in 'Live Wild or Die' No.1.

2) See "What's Behind the Spills", Greenpeace Magazine, June 1989, and "The Spills and Spoils of Big Oil", by John Greely, The Nation, May 29 1989.

3) For a chilling eyewitness account of the spill's effects, see "The Dead Zone: Disaster in Alaska", by George Michaels, in the September 1989 issue of 'The Animals' Agenda'.

4) The New York Times, April 23 and September 10, 1989. "Exxon Reneges on Cleanup", The Guardian, August 30 1989. In one report on the disaster originally done for the Chicago Reader, Jill C. Kunka writes, "What about the waste from the cleanup? Waste disposal may be the climax of Exxon's cleanup nightmare. According to the Anchorage Daily News, one ton of spilled crude turns into ten tons of toxic garbage - bags of oily grav-

el, mountains of synthetic absorbent booms and pads, discarded coveralls and the assorted refuse of 10,000 cleanup workers ... Service barges are collecting about 250 tons of waste per day. Much of this will be burned; the rest will be sent to hazardous waste landfills, probably in Oregon." A friend from Detroit also reported after a trip last summer to Alaska that several temporary incinerators were working around the clock in Valdez harbour. As Kunka writes, "With almost any environmental cleanup ... the problem just gets moved around." "Report from Alaska", Detroit Metro Times, Sept. 27-Oct.3 1989.

5) In his 1987 book 'The Toxic Cloud', Michael Brown reports that one exploratory drillship alone "can produce as much smog as 25,000 cars each traveling 18,000 miles."

6) The capitalist state has previously implemented recycling as public policy in time of war to gather materials at home in order to more effectively blow them to smithereens overseas.

7) Tara Jones quotes C. Perrow's 'Natural Accidents: Living with High-Risk Technology' (1984): "Systems that transform explosive or toxic raw materials or that exist in hostile environments [this could stand as a basic description of industrialism itself] appear to require designs that entail a great many interactions which are not visible and in expected production sequence. Since nothing is perfect - neither designs, equipment, operating procedures, materials and supplies, nor the environment - there will be failures... These accidents then are caused initially by component failures, but become accidents rather than incidents because of the nature of the system itself; they are system accidents, and are inevitable, or 'normal' for these systems." While this passage brings to mind dramatic, local accidents like Bhopal or

itself. We are also talking about peoples' communities and their deepest loyalties, in any case. But now that industrial capitalism is fast burning down the entire ecosphere the problem has become now more than ever how to link local and partial struggles to a larger vision that can assert itself as a movement and a cultural transformation carried out by millions of people. We must begin to talk openly and defiantly of the mass strike and revolutionary uprising that it will take to stop the megamachine from grinding up the planet. We must begin to consider what it will mean to "put ourselves out of work", to halt production and destroy the economy, creating a free society based on social and ecological cooperation in place of the work pyramid.

Those who might tremble at the idea of disemploying the working class and dismantling mass techniques and the economy of industrial dependence should know that this prospect was raised by revolutionaries a century ago. Kropotkin, for example, took up the question of the fate of thousands of workers involved in producing luxury and export commodities during a revolutionary period, when there would suddenly be no use and no market for them. To tell the labourers to become the masters of such factories "would be cruel mockery", Kropotkin wrote. Instead, facing the inevitable breakdown of the system, workers must learn to provide themselves with the basic necessities of life, food and shelter. Such facilities would simply be abandoned.⁽⁸⁾ When petrochemical workers and the rest of us working at meaningless jobs to prop up urban-industrialism confront our daily activities, won't our choices be the same? The idea of a revolution against urban-industrialism may seem far-fetched today. But in the future this idea may prove to have come so late as to be insuf-

ficient and not radical enough, given the conditions in which we find ourselves. While the question of violence remains an open one, no image of revolutionary uprisings of the past will serve us well in articulating the idea. Yet they may indicate to us what they proved to revolutionaries of the past, that a population that at one moment appears defeated and quiescent can rapidly transform itself and create sweeping changes. As Rudolph Bahro has written in his book 'Socialism and Survival' (1982), "The tendency is growing, and it is a tendency inherent in every human being, to entrust ourselves to an extreme alternative, however uncertain - because there is nothing left to do. The decision can suddenly take hold of millions - tomorrow or the day after - and expand the horizon of political possibility overnight." Such a process would not be motivated by a vision of negation only, but rather affirms the idea of restoration of human community and the integrity of the land organism, affirms a natural world and a social world renewed unto themselves and reconciled to one another.

The critical luddite sensibility that underlies it would make society as a whole a kind of philosophical school, through which deconstructing or unbuilding the megamachine - on the land and in our social relations - a form of inquiry making up its foremost spiritual, critical and practical project. By exploring this vision, we can perhaps begin to break out of our conditioning and domestication and create an entirely new life that combines the deep wisdom of primal animism with humility that the harsh lessons of history and modernity have brought.

Last spring, a fisherman told a journalist that when he was done working on the Exxon fiasco, he would load his boat and take his family away. When asked where, he replied, "Someplace where the

once had considered coral relatively immune from oil residues, but this has turned out not to be true. Organisms affected are more susceptible to epidemic disease and are likely to grow and reproduce more slowly than unaffected colonies.

Recent reports on the aftermath of the Amoco Cadiz spill off France's Brittany coast in 1978 also show that oil remains a serious problem for marine life long after a spill. In this case, the massive elimination of bottom dwellers such as urchins, razor clams and tiny crustaceans called amphipods brought about the decline and disappearance of fish species that feed on them. According to a New York Times report on the study, "On exposed mudflats that are continually covered and uncovered by the tides, almost all animal life was wiped out." (2 April 1989).

Figures vary on how much of an area was contaminated by the Exxon Valdez, but it was, at a bare minimum, 3,000 square miles, including at least 1,000 to perhaps 1,600 miles of shoreline. The long-term effects are particularly hard to determine given the cold waters and rough seas characteristic of the area. Recovery rates, if such a term can even be used meaningfully, vary widely as well. ("Recovery" can only signify a relative biological stability at a diminished level for a given ecosystem, since none can ever return to the pre-spill state with its full panoply of species diversity.) Furthermore, scientists judge "recovery" based on the ocean's ability to disperse and wash away oil, a view that implies that dilution of contaminants in the larger ecosystem is recovery. But the oil always goes somewhere, and with it, a steady, generalised contamination of the whole living planet. While the consequence of the overall contamination can never be precisely measured by scientists, the

silent pall over inlets and coves around the Sound, once teeming and noisy with wildlife, should serve as an indication.⁽³⁾

The Failure of Technology

Even "cleanup" represents one of those cruel jokes of language that mask a grim reality. Not only do many containment and cleaning techniques prove ineffective, they are often worse than the oil itself on the environment. Chemical dispersants, which are considered to be only ten to thirty percent effective under ideal conditions, are themselves highly toxic. High-pressure water treatment on beaches is very destructive to beach organisms, and the fertilizer used to clean beaches is also toxic. Traffic from workers doing clean-up weakens bottom sediment and destroys habitat. Rescue efforts only save a minute fraction, perhaps ten percent, of animals found, and many tend to return to the same area to be fouled once again. Birds cleaned and returned to the environment rarely, if ever, reproduce, and so are, in ecological terms, already dead.

(Recent work, by American ornithologist Brian Sharp, has turned up some depressing findings. He examined US bird-ringing files for the period 1969 to 1994 (which included the aftermath of the Exxon Valdez), and his grim conclusion was that cleaning of birds was largely pointless. The "life expectancy of oiled and cleaned guillemots after their release is only 9.6 days ... Unrolled birds survived between 20 and 100 times as long as oiled birds ... modern methods of cleaning and rehabilitating birds had not noticeably improved their survival rate ... a "negligible" number of oiled birds survive long enough to breed." Figures provided by Arthur Undley, head of wildlife at the RSPCA, tend to confirm Sharp's conclusions - of "some 2000 guillemots ringed in Britain after being cleaned of oil ... (most died) within a year of ringing ... but so far, six have shown up

later than that - and one bird was found 11 years later." While Lindley acknowledges that "very many die within a few weeks of being released" he still, inexplicably, sees the survival of a tiny fraction of the original number of birds as "encouraging". In any other field, a 'success' rate of 6 out of 2000 would be seen as intolerably low, calling into question the efficacy of the energy expended on it - which is why Lindley's comments on the figures seem remarkably weak, not to say self-deluding. It reinforces the suspicion that such clean-up efforts are intended less for the benefit of the birds than as a form of therapy for us - the exploitation of our guilt and disquiet of the consequences of our lifestyle by doing something - even if that "something" is understood to be largely useless. (All quotes, New Scientist 9/3/96.)

One great irony is the utter uselessness of the complex technological apparatus that has been developed to respond to oil spills. As Eugene Schwartz has written in "Overskill: The Decline of Technology in Modern Civilisation" (1971), technological ingenuity came to nothing in the Santa Barbara spill, the only relatively effective response ended up being the "low tech" strategy of spreading straw as an absorbent and collecting it with rakes and pitchforks.

The immense failure of mass technicians is vividly illustrated by Schwartz's description of two oil spills that took place during another season of spills - during February 1970, when in a period of sixteen days four major oil spills occurred in North America: a 3.8 million gallon oil spill in Chedabucto Bay, Nova Scotia; an oil platform fire in the Gulf of Mexico near New Orleans, fed by crude oil and gas escaping from wells drilled into the seabed; a spill in Tampa Bay from a grounded ship that eventually covered a hundred square miles of ocean before washing ashore and killing thousands of birds; and the spilling of 84,000 gallons of gas and diesel fuel when a barge collided

with a jetty in California's Humboldt Bay. Such accidents are "powerful reminders" of the helplessness of human ingenuity in disasters, Schwartz writes:

"The Gulf of Mexico accident unfolded like a Greek tragedy... After the fire had been extinguished with the help of dynamite on March 10, oil began to pour from the wells and to form a heavy slick. On the same day, the National Wildlife Refuge on Breton Island was menaced when an oil-collecting boom broke. The clean-up was reported to be 'going well' as the boom of heavy mesh fence covered with vinyl was repaired - only to break again. On March 11 the vinyl and plywood dams collapsed in heavy seas and over 1,500 barrels of crude oil began to move toward the oyster beds. The skimmer boats could not operate because of wind and high seas. On March 12 the incident was officially termed a 'disaster' as oil slicks covering fifty square miles of the Gulf neared the oyster beds. If necessary, it was planned to set off fireworks to startle a quarter-million geese to begin an earlier migration northward. On March 13 officials considered setting the oil on fire. An oil slick moved into the marshes of a wildlife refuge the next day while officials scanned wind notices to determine the course of the oil slicks. A well head used to cap a spouting well blew off on March 15, and the escaping oil added to the fifty-two-square-mile slick. Faced with a growing oil slick, the oil well's owners smothered the spouting wells with tons of mud and dynamite. They poured dispersant chemicals on the slicks though the effects of these chemicals on the marine life threatened by the oil had not been established... The Chedabucto Bay spill transformed the bay into a cold-water laboratory - with primitive measures taking precedence over scientific ones. Efforts were made to burn the spilled oil, but low sea temperatures

Economics' here for an exploration of environmental economics - see the whole of this 'Whose Common Future?' issue for more on enclosure.

5) Ibid. p.149.

6) Ibid. p.176.

7) Quoted in Ibid. p.174.

8) 'Wisdom of the Solomons', New Scientist 27/1/96.

9) 'Trade marks', Guardian 17/6/94.)

Landfills or other technological systems can be designed to securely contain hazards; pollution is merely a technological problem waiting to be solved. This is societal denial! Without an authentically alternative perspective, Edelstein argues, even the victims of direct contamination "are left to deal with toxic exposure in ways that force them to continue participating in the system that caused the pollution. Toxic activists seek 'cleanup' and other engineering solutions," pressing for health testing and compensation for victims. While Edelstein does not discount the necessity for such defensive strategies, he maintains that they nevertheless "serve to institutionalise and legitimate as a problem what might otherwise be viewed as a fundamental crisis and, thus, a challenge to our modern, industrial way of life." As for people not directly affected, even if they express a strong desire (in polls) to defend the environment, they do not recognise their own personal participation in the machine or what will be required to make changes. "Their lives are so compartmentalised that they live a lifestyle that supports the pollution habit, without even seeing the contradiction." The life-or-death biological crisis facing the earth becomes just one more abstract issue rather than a life-or-death crisis for the individual and community that demands immediate and radical response. To paraphrase an old adage, everyone talks about the crisis, but no

one does anything about it. The masses, a product of the mass society they have produced, continue on in their domesticated lives, suiciding themselves, future generations, and the land.

Even the militant responses are limited by the uncanny ability of the system to overcome and grow from its crises. After the Exxon spill, for example, thousands of credit cards were returned and gas stations felt the impact of a consumer boycott. The petrochemical industry, of course, continued operating. For a brief moment, Exxon served as the media "bad guy" and contributed a small share of its business to other oil companies, while managing to be consoled by its other sources of profit - plastics, paints, textiles, detergents, and services to the pulp and paper industry. Boycotts, demonstrations and other forms of militant response focus on some of the real culprits who benefit from ecocide, yet fall short of an adequate challenge to the system as a whole. On the other hand, to call for a boycott of all oil and gas as a strategy is the same as calling for an immediate mass strike against industrialism. It is provocative, but few are listening; even those who are listening are also trapped in the machinery, burning gas to stay alive.

Halt Production, Destroy the Economy

Such a commentary should not be interpreted as a call to abandon practical struggles in local communities and workplaces or around specific problems. For many, these battles are desperate measures, and when the house is on fire one tends to save whatever is in reach. It would be a grave error to simply give up such struggles on the basis of a more abstract image of a larger totality, for it is in such experiences where many people learn to fight and where the possibility of a larger perspective begins to present

on how much more income the forest could yield if left uncut), in order that its 'true' worth be more adequately reflected in a cost-benefit analysis. For them, as their leading light David Pearce says, "Every decision implies a monetary valuation". (4) For the sake, ostensibly, of environmental protection, they wish to make the equation more accurate, to leave nothing out. Even aside from the insoluble practical conundrum of what criteria are used to determine an object's value, on a philosophical level this model plays straight into the hands of capitalism. Instead of asserting that nothing has a price, it seeks to barcode everything, to leave nothing free of the stranglehold of market values.

Hence "Air is being enclosed as economists seek to transform it into a marketable 'waste sink'". (5) - safe maximum emission limits are calculated, and tradeable pollution permits issued (as in the US recently) "which award corporations property rights in atmospheric waste sinks." (6) While it caused much controversy at the time, within this sort of paradigm it made perfect sense for World Bank Vice-President Lawrence Summers to remark in December 1991 that the Bank should "be encouraging more migration of the dirty industries to the less-developed countries... underpopulated countries in Africa are vastly underpolluted... Their air quality is vastly inefficiently low (in pollutants) compared to Los Angeles or Mexico City". (7) After all, everyone has a pollution quota to meet - what is a 'sink' for, if not to be filled?

Some familiar British companies are in on this act - there is a nice ironic logic to the fact that our old friend Tarmac, champion of car culture, was awarded a contract to run an 'air quality monitoring service' a couple of years ago. This combines elements of the opportunistic environment industry with the dynamic of enclosure - Tarmac, one of the agents of enclosure (in the sense that they have partial responsibility for transforming good quality air into more of a 'finite commodity'), could be seen as positioning themselves as purveyors in the new market for 'pure air'. Another good example is the rise of bottled water in tandem with the decline in public water quality, a recent and previously unimagin-

able phenomenon that anticipates the advent of 'bottled air'. "Canisters containing about 10 minutes worth of 99.5% pure oxygen are sold in Britain as an 'old to healthier living, countering the effects of smog and pollution'". (8) Similarly, "The government of the Solomon Islands... plans to bottle and sell... oxygen" (8) - no doubt this could be marketed as green, ethically traded 'rainforest' air - a guarana, brazil nuts, et al.

Their business is to sell right back to us what was once ours. There are few examples that illustrate this principle as clearly (and as bizarrely) as the trade in frogs' legs from Bangladesh, which was finally brought to a (legal) end in 1989 after it boomed throughout the 1980s. "Talking frogs from the wild, it was pointed out, could have devastating consequences. Frogs are insectivorous and each one can eat more than its weight... In waterborne pests every day. Fewer than 50 frogs are needed to keep an acre of paddy field free of insects; they keep malaria and other illnesses at bay; they protect crops and are a natural biological control agent. Frog waste, too, is a fine organic fertiliser. Remove the frogs, said the scientists, and the only way Bangladeshi farmers could protect their crops and livelihoods was with pesticides. Indeed, from 1977-1989, Bangladesh imported more than \$89 million of some of the world's worst quality chemicals... By 1989 Bangladesh was importing an extra 25% of pesticides a year to cope with its frog loss... There was a further twist in the tale. Who should be exporting the frogs' legs to the west but Friends of the Earth Bangladesh discovered, some of the very same companies that were importing the chemicals." (9) (Within a year of instituting a ban on the export of frogs' legs, "Bangladeshi pesticide imports had declined 30-40%".)

FOOTNOTES

- 1) 'Scenes from a California Maul', Fifth Estate Autumn 1992.
 - 2) 'The Environment Industry - Profiting from Pollution', Joshua Kallner, The Ecologist March/April 1994.
 - 3) Ibid.
 - 4) The Ecologist July/August 1992, p.178.
- See the chapter on 'Economy and

frustrated ignition efforts with benzene, magnesium and flame-throwers. Old tires filled with napalm burned doughnut-shaped holes in the congealed oil and sank to the bottom. Chemical dispersants were halted by the government as being harmful to marine life. As at Santa Barbara, sawdust and peat moss were used to soak up the oil on the beaches, and bulldozers scraped up the contamination."

While some of capital's advanced technology may have improved slightly since the 1970s, no equipment is capable of responding to spills in heavy seas. Oil starts sliding under booms in currents of only seven-tenths of a knot, and goes over the top in wind and waves. Even large skimmers can only pick up small amounts and can only be used in calm seas. When gale force winds came up in Prince William Sound, the booms just blew away. And in the December 1988 spill along the northwest Pacific coast, high seas thwarted any response. Said a Canadian official, "It was simply a matter of waiting for the oil to hit the beach and clean it up manually." (Toronto Globe and Mail, 1 April 1989).

Ultimately efforts were to prove so ineffectual that the term "clean up" was replaced with that of "treatment" and "stabilization" of shorelines. Even though, after Exxon workers had cleaned up only half a mile of beach, an Exxon spokesman claimed that the beach had been left "cleaner than we've found it", the Times reported that "some of the painstaking cleanup is only spreading the oil around, moving from the high-tide mark down to the water's edge." A state official in charge of an inquiry into the spill remarked, "The cleanup is just not working. It's like trying to get the toothpaste back into the tube." By September, when Exxon announced that it was going to cease the cleanup, the

Alaska Department of Environmental Conservation reported that more than 300 miles of "treated" shoreline were still coated with oily muck as much as three feet deep. (4)

2. The Earth is a Company Town

For the institutions that administer and benefit from the petrochemical megamachine, the spill was a "terrible disaster" too, if only a temporary one. The spill indicated, contrary to corporate reassurances of infallibility, that not everything went exactly according to plan, and that can make the natives restless.

Exxon and the oil company pipeline consortium Aleyska, along with the usual government and corporate allies, immediately followed the strategy always employed in the wake of a toxic accident - managing appearances with the appearance of management. Thus the reassurances and declarations of concern came rolling off production lines along with slick photos of Exxon workers holding cleaned up, healthy looking otters and ducks.

The model for capitalist crisis management of such disasters remains the toxic chemical gas leak at a Union Carbide factory in Bhopal, India, in 1984. As Tara Jones has written in a recent book, "Corporate Killing: Bhopals Will Happen" (Free Association Books, 1988): "The crisis Bhopal created was one which required both immediate and long-term management. In the management of this crisis, the victims' needs were totally neglected: the predominant priorities were the economic interests of [Union Carbide] and the Indian state. In the ensuing macabre dance of death, the dead and walking wounded were left by the wayside, while the main protagonists

ests. " For the continuance of industrial capitalism, the accident at Bhopal was not an ecological or even a technological crisis (accidents being inevitable) but rather a public relations crisis, and thus, potentially, a social crisis if people began to take the lessons of the gas leak seriously. Hence, the entire chemical industry worked " to reassure the general public that Bhopal was a rare, chance occurrence that would not be repeated, " rather than a dramatic example of a continuous process of toxic contamination.

As soon as the news hit about the oil spill in Prince William Sound, Exxon followed Union Carbide's strategy of cleaning up ... the propaganda environment. By hiring nearly every boat in Valdez and Cordova harbours, and with the stipulation that no media would be allowed on them without permission from the company, Exxon prevented most environmental groups and critical journalists from even getting to Bligh Reef to survey the damages. The crew of fishing boat nicknamed "the Hearse", which brought garbage bags filled with dead animals into Valdez harbour every few days, was told not to bring in animals that had been dead more than two weeks to avoid stirring up reporters.

Exxon's body counts varied wildly from all others. "The numbers just don't match," one disgusted worker told George Michaels of *The Animals' Agenda*. "The [Exxon] press release says that 500 otters have been brought in dead in the past six weeks. I've counted 600 myself in the past week." Exxon continued to release regular notices that the spill had been contained and cleaned up even as it continued to grow in size and severity, and produced a slick video entitled "Progress in Alaska", which extolled the corporation's environmental commitment and the success of its response to Valdez, as well as the benefits the industry has

brought to a state which receives 85% of its revenues from oil. Full-page ads in newspapers across the country were bought by Exxon to defend its role in the affair, and Exxon maintained tight control of emergency response efforts, much in the same way, say, that a mass murderer might be hired to head up the forensic study of the massacre.

The propaganda blitz was intense because the stakes were high. Suddenly, off-shore drilling and exploration of sensitive wilderness areas (policies contested even before the spill) were getting the spotlight along with information about oil company practices - leaks of far greater concern to capital than a few million gallons of oil.

Speaking before the National Ocean Industries Association, an organisation of companies linked to off-shore oil extraction, Interior Secretary Manuel Lujan warned his corporate cronies: "If the image of an uncaredful and uncaring industry prevails among the US public, then we can kiss goodbye to domestic oil and gas development in the Arctic National Wildlife Refuge, off-shore and in the public lands." For Lujan, the Valdez spill might hinder oil exploitation much in the same way that the accident at Three Mile Island stalled the construction of nuclear power projects. And he did not hesitate to call further exploration and extraction, including in wilderness areas, a matter of "national security", even though the coveted Arctic National Wildlife Refuge is estimated to have enough oil for a mere six months supply for US cars and trucks. To the industrialists, the oil must keep flowing at all costs, and one terrifying question - when will society begin to do without oil - is not even allowed. It is a matter of state security: capitalism, certainly, cannot exist without oil.

Meanwhile the image of a "caring"

capitalism from a system of the production of goods to one of creating needs for new goods. In the words of one business executive of the time, US capitalism had to engender the 'organised creation of dissatisfaction'. (1) Two good examples of manufactured, spurious 'needs' are the market for garden peat, and the use of (over-priced) disposable nappies in place of fancy cloths: the appearance of markets for these two products is a very recent phenomenon, with demand for them being practically non-existent before the 1960s. As with most products, there is a serious environmental corollary involved - one requires the strip-mining of British peat bogs, while the other contributes to the decoupling of temperate rainforests worldwide.

In a similar vein, calls for environmental protection usually spring from a sense of revision (conscious or otherwise) at capitalism and its works. But this revision can be twisted against itself and to capital's advantage: the way in which the environmental debate is framed, and that revision expressed, is all important - it can be used to reinforce capitalism, as the rise to solutions that create enormous opportunities for expansion, creating new goods and services, new 'needs'. George Broadford highlights this process of work in the wake of Exxon Valdez, with a temporary boom ensuing from the clean-up operations, and everybody clamouring for a piece of the toxic action. Properly managed, what looks like an image crisis for the companies concerned, and by extension, for oil companies, can turn into a growth bonanza.

Exxon Valdez - and other disasters - are, as Broadford points out, just spectacular manifestations of a much bigger, all pervasive and insidious syndrome. Their business is disaster - both because its routine functioning involves contamination the like of which Exxon Valdez is just a time-lapse image, and because they thrive on the crises they create. This is exemplified by the lucrative 'environment industry', which has developed to such an extent over the last twenty years that it now represents nearly 2% of the US GNP. (2) As pollution started to become a political issue, companies

pushed for an 'end-of-pipe' technofix approach to the problem - rather than preventive measures involving changes to the production process itself. (Or how about the ultimate preventive measure - an end to industrial capitalism and to the bulk of its production processes?) Perhaps unsurprisingly, the companies' preferred option won out, and the end-of-pipe approach was installed as society's answer to the threat of pollution. This has resulted in an amazingly cynical situation whereby many of the greatest polluters (eg. old friends such as General Electric, Du Pont and Westinghouse) also snap up contracts to mitigate pollution. They are 'market leaders in pollution', profiting of both ends of the chain - one might say that they, like the rest of the capitalist economy - are in a constant state of devouring their own entrails. What is more, as Third World nations begin to face an environmental crisis of their own brought on by the Western development model, these 'pollution specialists' are poised to go global, exporting expertise and technology, and thereby embarking on a brand new profit cycle. (3) The polluters portray themselves as the only people who can rescue us from the fire mess they've gotten us into - in this sense, environmentalists must beware of functioning as little more than company sales reps.

As I said, the critical question is how the debate is framed - it determines whether capitalism will be able to assimilate our concerns and thus make financial and ideological use of them. Capitalism depends on the process of enclosure - put crudely, the way in which something is quantified as a finite commodity (eg. the introduction of the concept of 'scarce commons') and then privatised. The privatisation is then supposed to regulate a rational distribution and use of the thing in question thereby preventing a 'tragedy of the commons' from developing. The new discipline of 'environmental economics' is a reformation of the environmental debate - it is an attempt to enclose environmentalism on its terms. Such progressive economists seek to assign a value to an item such as a rainforest - eg. the studies don't

mass energy-use, mass consumption of mass-produced goods.

As Jacques Ellul writes in 'The Technological System' (1980), "It is the technological coherence that now makes up the social coherence... Technology is in itself not only a means, but a universe of means - in the original sense of Universum: both exclusive and total." This universe degrades and colonises the social and natural world, making their dwindling vestiges ever more perilously dependent on the technological environment that has supplanted them. The ecological implications are evident. As Ellul argues, "Technology can become an environment only if the old environment stops being one. But that implies destructuring it to such an extreme that nothing is left of it." We are obviously reaching that point, as capital begins to pose its ultimate technology, biotechnology, and the illusion of total biological control, as the only solution to the ecological crisis it has created. Thus, the important insights that come from a class analysis are incomplete. It won't be enough to get rid of the rulers who have turned the earth into a company town; a way of life must end and an entirely new, post-industrial culture must also emerge.

4. Revolution or Death: Against the Megamachine

A new kind of thinking presently haunts the despair and bad faith that now rule the world. It recognises that a whole order must be abolished, that we must retrace our steps, that the machine must stop once and for all, if we are to avoid going over an abyss. Yet this vision for the most part remains hidden; the necessary shift in thinking and the practical strategies that it suggests have not

generally occurred even in many of those human communities most adversely affected by growing social and ecological degradation.

Michael Edelstein's discussion of the impact of contamination on communities takes up this problem. Edelstein has studied several communities reeling from the consequences of contamination or in the process of trying to stop industrial projects that are proposed, and describes how these experiences can dramatically radicalise people, creating the basis for communities of resistance (if only temporarily), and ultimately, inspire people to begin to "challenge core assumptions of the overall society." Any doubts about the far-reaching, radical, even revolutionary, potential of the anti-toxics and anti-development movements will be dispelled by this book.

Nevertheless, as Edelstein points out, it is the failure to recognise and confront the context and social content of mass contamination that finally leaves these communities powerless to halt it. Society as a whole engages in "denial and rationalisation" in thinking that a single accident or problem can be resolved in isolation from the total fabric, in thinking that the mass urban-industrial society can continue to operate without contamination and ecological destruction. "We no longer deny the existence of pollution," he writes; "instead we adopt the engineering fallacy - that pollution simply needs to be 'cleaned up'."

(Capitalism needs to create demands for itself, making it and its products indispensable, and life without its supply mechanisms unthinkable, thus justifying its existence. In a Faustian pact, its attendant misery and ubiquitous desolation comes to be seen as a price worth paying if the goods and services it offers us are to be obtained. "In the 1920s the birth of mass advertising signalled a transformation of

corporation is disseminated for the gullible. One Exxon publicist called a boycott of the company "unjust", adding that the spill "was an accident - a bad one. But accidents can happen to anyone." This was the accident, of course, that such publicists had formerly claimed would never happen.

Economic Boom = Ecological Bust

Ever since the construction of the Prudhoe Bay oil field on the Arctic Ocean (the largest contiguous industrial complex in the world), the oil industry provided every assurance of safety to those uneasy with oil development in Alaska's pristine waters and wilderness. Flush with petrochemical plunder, the State of Alaska and the corporations that had staked it out rode a giddy wave of technological hubris and gold-rush corruption. Alaska became a Boom state, providing one quarter of all US domestic oil. In exchange for Prudhoe Bay, the state doubled its budget on public services, repealed personal income taxes, and created a trust fund out of which it pays an annual dividend to all Alaska residents.

Some Alaskans resisted oil development in the beginning, but Big Oil swept all opposition aside, both by using the law to further its own interests and by circumventing it whenever necessary. In the 1970s, fishing communities and environmentalists fought the Aleyksa pipeline all the way to the Supreme Court and won, but Congress simply declared the project exempt from environmental laws. State laws were also overrun and modified to accommodate the nine-company consortium seeking to build the pipeline across 800 miles of Alaska wilderness to the port at Valdez.

Oil development came accompanied by promises of the "best technology", safety reviews, and an upgrading of facil-

ities as volumes rose. Not even these dubious promises materialised. Instead of cleaning up toxic pits left in drilling, it is cheaper for oil companies to pay penalties for abandoning them, and even the inadequate environmental protection laws are routinely ignored. As John Greely notes in *The Nation*, Port Valdez was already considered one of North America's most "chronically polluted marine environments" by scientific agencies. Small spills - some 400 before the Valdez spill - were a continuous problem.

Big Oil built itself not just a few company towns but a company state. The wave of new immigrants brought by an expanding economy continued to erode opposition to development and the corporations. Housing, schools, roads, power projects - the whole infrastructure of the modern capital-energy-commodity-intensive society - were constructed with the revenues. And when society-wide corruption and collusion didn't work, Aleyksa used a mix of cover-up, publicity campaigns and legal maneuvers to continue operations unimpeded, for example going into court in May, after the spill, to block more stringent pollution controls at Valdez. Greely quotes a toxicologist: "If Aleyksa is an example of how these oil companies operate in an environmentally sound manner, what are the companies doing in more remote wilderness areas with even less supervision?"

A good question. If the idea of a "third world" suggests a plundered colony where brute force, super-exploitation, and a veil of secrecy prevail, then Prudhoe Bay is a kind of third world colony. The complex, encompassing a 900 square mile wasteland of prefab buildings, drilling pads, pipelines, roads and airstrips, matches any nightmare in the industrialised world. Burning fuels blacken the Arctic sky, causing air pollu-

tion that rivals the city of Chicago. According to the March-April 1988 *Greenpeace Magazine*, "Some 64 million gallons of waste water containing varying amounts of hydrocarbons, chemical additives, lead and arsenic have been released directly into the environment. Regulators report up to 600 oil spills a year, and five hazardous waste sites at Prudhoe are already candidates for clean-up under Federal Superfund law. In addition, the oil companies have been cited for numerous violations of federal and state environmental laws," which does not reveal how bad things are, since many violations obviously go unreported. Road and building construction has thawed the permafrost and caused flooding; this has spread toxic chemicals, and affected an area much greater than the actual development itself.

Hundreds of waste pits overflow during the late spring thaw, killing off small freshwater animals low on the food chain, but also causing dramatic poisoning incidents. Last year, for example, a polar bear was found dead, stained pink from drinking industrial poisons not even normally found together. Other wildlife has been affected. The oil companies are quick to point out that the caribou population is up, but that is largely due to the mass extermination of wolves during 1977-78 by hunting guides when road construction created more access to remote areas. In reality, many questions remain about the caribou and how they will be affected in the long run.

In a letter to the *New York Times*, two people who had been weathered in at Deadhorse (at the heart of the Prudhoe complex) on their way to the wildlife refuge to the east, describe seeing "thousands of vehicles in use and abandoned, ranging from pickup trucks to massive mobile drilling equipment, stacks of discarded oil drums, small ponds with

greasy slicks and general debris." Dozens of abandoned structures stand in and around the development at Deadhorse, with no indication that any is to be reused or removed as oil exploitation (which has already reached its peak) starts to wind down. "Merely to remove the accumulated vehicles, buildings and drilling equipment," they continue, "not to mention detoxifying the polluted tundra and dismantling the roads, airstrips and pipelines, would take years and hundreds of millions of dollars. Who will pay?" (4 April 1989)

Another good question. Yet when one considers what the actual energy expense of building and operating such a vast and remote complex might be, even before an attempt at any kind of "stabilization" of the environment, the realisation sinks in that this development is representative of the entirety of industrialism: a massive pyramid scheme that will collapse somewhere down the line when all the major players have already retired from the game. Of course, when the last of these hustlers cash in their chips, there won't be any place left to retire to.

The Greenhouse Effect: Capital's Business Climate

It should go without saying that Exxon and its allies don't try their best to protect the environment or human health. Capitalist institutions produce to accumulate power and wealth, not for any social "good". Thus, predictably, in order to cut costs, Exxon stealthily dismantled what emergency safeguards it had throughout the 1980s, pointing to environmental studies showing a major spill as so unlikely that preparation was unnecessary. So when the inevitable came crashing down, the response was complete impotence and negligence.

as an alien power, it is because the apparatus is controlled by the capitalist ruling class, not because such technics are themselves uncontrollable.

This ideology, accompanied usually by fantasies of global computer networks and the complete automation of all onerous tasks (machines making machines and drill the oil and manufacture the plastics, etc.), cannot understand either the necessity for strict and vast compartmentalisation of tasks and expertise, or the resulting social apathy and stratification and the impossibility of making coherent decisions in such a context. Unforeseen consequences, be they local or global, social or ecological, are discounted along with the inevitable errors, miscalculations, and disasters. Technological decisions implying massive intervention into nature are treated as mere logic problems or technical puzzles which workers can solve through their computer networks.

Such a view, noted in the nineteenth century technological and scientific optimism that the workers' movement shared with the bourgeoisie, does not recognise the matrix of forces that has now come to characterise modern civilisation - the convergence of commodity relations, mass communications, urbanisation and mass technics, along with the rise of interlocking, rival nuclear-cybernetic states into a global megamachine. Technology is not an isolated project, or even an accumulation of technical knowledge, that is determined by a somehow separate and more fundamental sphere of "social relations". Mass technics have become, in the words of Langdon Winner, "structures whose conditions of operation demand the restructuring of their environments" ("Autonomous Technology", 1977), and thus of the very social relations that brought them about. Mass technics - a product of earlier

forms and archaic hierarchies - have no outgrown the conditions that engendered them, taking on an autonomous life though overlapping with and never completely nullifying these earlier forms. They furnish, or have become, a kind of total environment and social system, both in their general and individual, subjective aspects. For the most part, the le never grasped Marx's acute insight that as human beings express their lives, so they themselves are. When the "means of production" are in actually interlocking elements of a dangerously complex, interdependent global system, made up not only of technological apparatus and human operatives as working parts in that apparatus, but of forms of cultural and communication and even the landscape itself, it makes no sense to speak of "relations of production" as a separate sphere.

In such a mechanised pyramid, in which instrumental relations and social relations are one and the same, accidents are endemic. No risk analysis can predict or avoid them all, or their consequences, which will become increasingly great and far-reaching. Workers councils will be no more able to avert accidents than the regulatory reforms proposed by liberal environmentalists and the social-democratic left, unless their central task is to begin immediately to dismantle the machine altogether.(7)

The left also fails to recognise what is in a sense a deeper problem for those desiring revolutionary change, that of the cultural context and content of mass society - the addition to capitalist-defined "comforts" and a vision of material plenitude that are so destructive ecologically. The result is an incapacity to confront not just the ruling class, but the grid itself on the land, in society, in the character of each person - of mass technics, mass mobility, mass pseudo-communications,

spread contamination continues. Factories, energy facilities, airports, mines and the rest remain. As it becomes profitable and necessary, recycling will certainly be institutionalised within the system, but it will not significantly alter the suicidal trajectory of a civilisation based on urban-industrial-energy development and the production and circulation of commodities. (6)

Limitations of leftism

Despite numerous insights into commodities and the market economy, the left historically has always embraced the industrial, energy-intensive system originally generated by private capitalism as a "progressive" force that would lay the basis for a free and abundant society. According to this schema, humanity has always lacked the technological basis for freedom that industrial capitalism, for all its negative aspects, would create. Once that basis was laid, a revolution would usher in communism (or a "post-scarcity" society) using many of the wonders of technology that were capitalism's "progressive" legacy. Presently, capitalism has allegedly outlived its progressive role and now functions as a brake on genuine development. Hence it is the role of the left to rationalise, modernize, and ultimately humanise the industrial environment through socialisation, collectivisation and participatory management of mass technics. In fact, in societies where the bourgeois class was incapable of creating the basic structures of capitalism - urban-industrial-energy development, mass production of consumer goods, mass communications, state centralisation, etc - the left, through national revolution and state-managed economies, fulfilled the historic mission of the bourgeoisie.

In the leftist model (shared by

leninist and social democratic marxists, as well as by anarcho-syndicalists and even social ecologists), the real progressive promise of industrialisation and mechanisation is being thwarted by private capitalism and state socialism. But under the collective management of the workers, the industrial apparatus and the entire society can be administered safely and democratically. According to this view, present dangers and disasters do not flow from contradictions inherent in mass technics (a view considered to reflect the mistake of "technological determinism"), but rather from capitalist greed or bourgeois mismanagement - not from the "forces of production" (to use the marxist terminology) but from the separate "relations of production".

The left, blinded by a focus on what are seen as purely economic relations, challenges only the forms and not the material, cultural and subjective content of modern industrialism. It fails to examine the view - one it shares with bourgeois liberalism - that human freedom is based necessarily on a material plenitude of goods and services. Parroting their prophet, marxists argue that the "appropriation" by the workers of the "instruments of production" represents "the development of a totality of capacities in the individuals themselves." Conquest of the "realm of necessity" (read: conquest of nature) will usher in the "realm of freedom". In this view, the material development of industrial society (the "productive forces") will make possible the abolition of the division of labour; "the domination of circumstances and chance over individuals" will be replaced "by the domination of individuals over chance and necessity." (Marx and Engels, "The German Ideology") Mastery of nature by means of workers' councils and scientific management will put an end to oil spills. Thus, if mass technics confront the work-

Yet to focus on disasters as aberrations resulting from corporate greed is to mystify the real operational character of an entire social and technological system. The unmitigated disaster of daily, undramatic activities in places like Prudhoe Bay and Bhopal - even before they enter the vocabulary of doom - is irrefutable proof that Valdez was no accident but the norm. Modern industrialism cannot exist without its Prudhoe Bays. Capital must always have a super-exploited colony, a "sacrifice area" of some kind - the sky, a human community, a watershed, the soil, the gene pool, and so on - to expand and extend its lifeless tentacles.

The real spillage goes on every day, every minute, when capitalism and mass technics appear to be working more or less according to the Plan. The Exxon Valdez contained some 1.2 million barrels of oil; at any given time 750 million barrels are floating on the world's waters. In 1979 the amount of oil lost worldwide on land and sea through spillage, fire and sinkings reached a peak of 328 million gallons (A record which was doubtless surpassed during the Gulf War); since then it has dropped to between 24 and 55 million a year, except for 1983, when tanker accidents and oil blowouts in the Iran-Iraq War brought the total up to 242 million gallons. Most of the oil in the oceans comes not from accidents but municipal and industrial runoff, the cleaning of ship bilges and other routine activity. Industry analysts say that major oil spills have declined, but that "smaller" spills continue to take place all the time, a phenomenon paralleled in the chemical industry by focussing on major leaks to conceal the reality of a slow-moving, low-level, daily Bhopal. And no matter how carefully industry tries to prevent accidents, they are going to occur; the larger and more complicated the system, the more certain the breakdown. As the head

of the Cambridge-based Centre for Short-lived Phenomena (!), which keeps track of oil spills, commented after the Valdez spill, because such an event "takes place so infrequently, and the resources are never available in a single location to deal effectively with it" (meaning because booms can't be stationed every hundred yards along the route, etc.) major spills are inevitable.

In any case, mass society is a continuous oil spill just as it is a constant chemical leak. The 11 million gallons lost by the Valdez on Bligh Reef is matched every year in the state of Michigan alone by citizens pouring waste oil down sewers or on the ground. (See related story in box.) And while it is true that more safety measures could be taken through institutional or technological means (or even by revolutionary workers councils or assemblies), industrialism brings inherent consequences of spills, leaks, inadequate response, inadequate "treatment", and ecological bust. As petrochemicals are necessary to industrialism whatever the form of management, spills are also integral to petrochemicals. And what chemicals and oil spills are to a society addicted to industrialism, industrialism is to the living fabric of the planet. This observation was raised by writer Bill McKibben in an essay published on the Op-Ed page of the New York Times on April 7. McKibben asked what would have been the result had the Exxon Valdez gotten through without a hitch? If ten million gallons had gotten through to be consumed, they would have released about 60 million pounds of carbon dioxide into the atmosphere. Carbon dioxide is the major component gas causing the greenhouse effect, in which gases emitted in enormous quantities by industrial civilisation will trap heat in the atmosphere and raise global temperatures, disrupting and profoundly transforming the

Goodbye Cleveland

"When I was a kid, the guys in my crowd used to view changing the oil in our cars as sort of a manly rite of passage on the way to adulthood. We'd dump the used oil down the nearest sewer laughingly, saying "Hello Cleveland", knowing that it would travel through the Great Lakes waterways to the cities downstream. That was before the age of ecological awareness, but we still had the realisation the oil was going somewhere.

Now, because of that same disposal process, every two and a half weeks home mechanics create an oil spill the size of the one at Valdez, Alaska. Each year, 1.2 billion gallons of oil are guzzled by vehicles in the US with half of it burning up in the engines they lubricate (a major source of pollution itself) while the other 600 million gallons are removed at oil-change time.

The American Petroleum Institute, an industry association, estimates that at least 240 million gallons of the latter figure (the Environmental Protection Agency thinks even more) are improperly disposed of during home changes by being dumped in sewers, directly onto the ground or in the garbage which then winds up in landfills.

This largely unseen, unrecorded ecological disaster has far-reaching effects. Motor oil easily contaminates groundwater when it seeps through landfills. When it reaches lakes, streams and rivers from sewer systems, it interferes with photosynthesis and the water's oxygen level and can introduce oil into the food chain. When oil goes through sewage treatment facilities it disrupts bacteria which breaks down organic waste and results in the release of improperly-treated sewage into water systems. A quart of oil can foul the taste of a quarter-million gallons of drinking water.

Now we all live in Cleveland.

- E.B. Maple

(In the UK "each year...28 million gallons of motor oil go missing, presumably finding their way into our freshwater systems." (1) As E.B. Maple suggests, it has a devastating impact - "Used oil is considerably more toxic and carcinogenic than the Exxon crude: one gallon can contaminate one million gallons of fresh water." (2) Unfortunately, even the waste oil that is kept out of the freshwater system through recycling is then used as heating fuel - which "releases heavy metals, chlorines and fluorines into the atmosphere ... Space heaters in 10,000 garages throughout the country burn at least 40,000 tonnes of waste oil a year with no restrictions at all." (3) Out of the sewer and into the fire!

1. "Carnageddon", Green Line no. 91, October 1991.
2. 'Wrong Side of The Tracks', TEST, quoted in 'Ban Cars', The Terra Firm no.2, Mundi Club, undated.
3. Green Activist' magazine, quoted in ibid.

in the other ninety), his statement provides little in the way of a critique of the world of the ninety percent and says nothing about the forces and institutions that determine "normal life" there.

As for those institutions, they have in many cases recognised the benefits of conservation and have preserved areas chosen to exploit such preserves when it was decided that the "benefits" outweighed the "costs". (One cannot help but be reminded of the remark of an oil company executive, in the manner of a vampire, "The day you see gas lines in the Lower 48, the Alaskan wildlife refuge will open to us.") The environmental movement has been, from the beginning, one of retrenchment, temporary stalemate, defeat and retreat. As Brower comments, "All a conservation group can do is defer something. There's no such thing as a permanent victory. After we win a battle, the wilderness is still there, and still vulnerable. When a conservation group loses a battle, the wilderness is dead." The same holds true for communities defending themselves from corporations seeking to site landfills and toxic production facilities. In his painful and often extremely enlightening study of such communities, "Contaminated Communities: The Social and Psychological Impacts of Residential Toxic Exposure" (1988), Michael R. Edelstein describes a successful fight in Richton, Mississippi, to stop a nuclear waste repository. "Even with the project now abandoned," he writes, "there remains a feeling of 'perpetual jeopardy' in Richton resulting from the likelihood that so visible a site will attract some other hazardous waste proposal."

Lacking a perspective that challenges the capitalist order, environmentalists have seen their rhetoric captured

and employed by the contaminating corporations and the state. The bureaucrats administering hazardous waste and garbage incinerators can be found parroting the environmental slogan "reduce, reuse, recycle," and conservation is touted as a patriotic duty. All such rhetoric on the part of the contaminators amounts to an enormous scam, since capitalism - at least in its present configuration, which could not be abolished without a civil war - is based on extractive-exploitive industries such as mining and metals, petrochemicals, forest products, etc. (Perhaps modern 'industrial agriculture' is an example of another such industry - figures for soil loss would certainly tend to suggest this.) No matter how assiduously the average person recycles household waste, these industries will continue to operate, and there is a direct correlation between the economic wellbeing of these industries and destruction of the environment. Economic growth demands ecological bust. If capitalist concerns do not grow, they will collapse and die. The privileged functionalities of such institutions have already clearly expressed their preference that everything else die first.

As for municipal recycling, that panacea of liberal environmentalism, not only is capitalism capable of rationalising its production through such piecemeal reform, it will soon do so in North America once the waste management industry has created technical and economic infrastructures to make it profitable. (Until that time, recycling will, for the most part, fail, which is what is already happening in many municipalities that now find themselves sitting on tons of recyclable materials that can find no market.) In places such as Japan and Western Europe, where materials recycling can sometimes reach more than half of the municipal waste stream, wide-

at best only achieve the same diminished stability in the social sphere that they do ecologically in places like Prince William Sound.

Rozak observes, "If modern society originally embraced industrialism with hope and pride, we seem to have little alternative at this advanced stage but to cling on with desperation." Of course, this is to cling on to a sinking ship, but that we do. Mass society has taken its predictable revenge on those forced to inhabit it, eroding the inner strength and visionary impulses of human beings as continuously as it has degraded and simplified the natural world. Disaster being a permanent condition of life, so quickly is one horror followed by the next, we have been disciplined to focus on the media-tized version of this season's industrial plague while all around us the hundred hydra heads flourish.

The image of the hydra occurred to me while driving my car to an event organised to show opposition to one of the hydra's local manifestations - the world's largest trash incinerator, which burns about a mile from where I live. Hearing the news of Prince William Sound, I saw the whole series of misfortunes originating in Prudhoe Bay (or rather, in some boardroom), and running through Prince William Sound down to me filling my gas tank in Detroit.

While I was gassing up to get to some modest attempt to oppose a piece of the monster, it had hiccupped and knocked off a whole section of the planet. Every day, in fact, it is the same concatenation of misery, a tidal wave of desolation and ruin that does not in any meaningful way, ultimately serve the long-term interests of even those who administer it. It's exterminism in action: the hydra. In the myth, Hercules was at least able to cut off a head before two appeared in its place; we don't even have that small satisfaction before a hundred more appear.

contest this horror and create a liberatory ecological society in its place clearly reveals the limitations of two currents of fragmented opposition to it, environmentalism and leftism.

Limits of environmentalism

Environmentalism emerged as an ethical reassessment of humanity's relation to, and thus as a protest against, the wanton exploitation and destruction of the natural world. As a social movement it has sought to set aside and protect nature preserves, while trying to institutionalise, within modern capitalism and through the state, various safeguards and an ethic of responsibility toward the land. Despite its appeal to a non-anthropocentric ethical perspective and its often vigorous and courageous battles to defend nature, environmentalism has lacked an acute critique of key social forces that propel ecological destruction: capitalism, empire and the state. Even where it has elaborated a partial critique of industrialism and mass society, it has generally failed to recognize the close connection between urban-industrialism and capital. Rather, it has attempted to reform the existing system by rationalising and humanising it.

This perspective is illustrated by a comment made by David Brower, an indefatigable environmental crusader who inspired many of the radical environmental activists today. Speaking to author John McPhee, Brower remarked, "Roughly ninety percent of the earth has felt man's hand already, sometimes brutally, sometimes gently. Now let's say, 'That's the limit.' We should go back over the ninety and not touch the remaining ten percent. We should go back, and do better, with ingenuity. Recycle things. Loop the system." ('Encounters with the Archdruid', 1971). Even if Brower's figures are true (and even if the ten percent

"normal life" appropriately describes industrial capitalism, if McKibben's recommendation that "less energy" be used is to meaningfully confront the looming greenhouse crisis, such a reduction in industrial activity will have to be far more dramatic than almost any sectors of society have been willing to ponder so far. It would signal a deconstruction process more profound than any revolutionary transformation of society ever seen previously. Whether or not this prospect is possible is an open question.

Whether or not it is necessary is a question that must include the recognition that present environmental effects are the results of activities several decades ago. And since modern science cannot understand thresholds, there is no telling how much time is left, only a certainty that it is running out.

3. Disaster Fuels the Machine: The Hydra

Warnings of the inevitable crash of urban-industrialism's house of cards now appear often in the leading capitalist newspapers. The ruling classes cannot help but suspect that their system is drawing the world toward a cataclysm. Yet they cannot respond and grimly go about their business like distracted Ahab's trying to maintain control of their foundering ship. The entropy inherent in their system overwhelms them as they grapple for a helm that does not exist. In this respect they resemble any ruling class near the end of its historic journey.

French president Mitterand seemed to sense as much when at summit discussions on the environment last summer he remarked that there was "no political authority capable of making decisions on a global scale." The authority of the modern state cannot find a solution, of course, because it has come to encompass

planet's ecology - capitalism's 21st century Global Business Climate, so to speak. McKibben writes that in the next century, "There will be twice as much carbon dioxide in the atmosphere as there was before the Industrial Revolution." The effects are unclear to scientists, but nearly all agree that the burning of fossil fuels combined with the release of chemicals that destroy the planet's ozone layer in the upper atmosphere, the generation of heat from all sources, deforestation and other factors will bring about massive species extinctions, climate and weather changes, flooding and other havoc.

The average car reproduces its own body weight in carbons each year. This is "another oil slick", McKibben notes, being released every day. And while technological modifications to make "clean-burning" cars may reduce pollutants such as carbon monoxide and hydrocarbons by as much as 96%, such cars will emit as much carbon dioxide as a Model T. Electric cars will pose a similar problem if their energy comes from fossil fuel sources. (See related box Insert 'Never Trust a Techno-Fix'). The production of automobiles, and the production of anti-pollution technology itself, are not even taken into account by this analysis, but the inherent failure of technological reason can be seen.

The rate of climate change over the next hundred years may dwarf by thirty times the rate of global warming that followed the last Ice Age. Reducing what comes out of tail pipes won't even put a slight dent in that problem.

"The greenhouse effect," McKibben observes, "is not the result of something going wrong. It doesn't stem from drunken sailors, inadequate emergency planning or a reef in the wrong place. It's harder to deal with than that because it's just a result of normal life." Leaving aside the question of whether or not the phrase

Never Trust A Techno-Fix!

With the "Great car economy" currently under attack on all sides, a colossal hoax is being perpetrated in order to ensure its survival. We are being encouraged to believe that it is the choice of fuel (i.e. petrol) that is the root cause of the ecological and social havoc wreaked by the car. Simply replace the internal combustion engine with batteries and hey presto, a problem that goes to the very heart of our society disappears. This is a deeply dubious proposition, for a number of important reasons.

Firstly, and most obviously, as Fifth Estate suggest, without a shift away from fossil fuels as a source of energy, electric cars will only exacerbate global warming. CO2 production will only be centralised and increased. (However, it is worth remembering that the various non-fossil fuels that are mooted often still have a damaging impact themselves - for a preliminary outline of such impacts, see the Mundi Club's "The Geophysiological Threats Posed by Green Cars".)

Secondly, in the unlikely event of what Greenpeace call the "fossil fuels energy scenario" (fles) coming about, this takes no account of the historic "carbon debt" owed by humanity to nature - we urgently need to balance the historic carbon budget. This would require remedial action (e.g. perhaps, wide-ranging reforestation) for beyond simply stopping future emissions. (1)

Thirdly, there is the related, and usually overlooked, question of the "demand side" of the earth's carbon cycle. A lot of attention is focussed on the supply side - e.g. on exhaust fumes. Simply put, there is no acknowledgement of the fact that by physically covering the planet with roads, car parks, refineries, mines, etc., you erode its photosynthetic capacity, its ability to absorb the CO2 that is created. In England alone, "Since the war 705,000 hectares of countryside have gone more than the combined area of Greater

London, Hertfordshire, Berkshire and Oxfordshire ... At the present rate of loss, a fifth of England would be urban by the middle of the next century." (2) These trends on a global level have meant that: "Before World War Two, photosynthesizers on dry land produced perhaps 150 billion tons of dry weight of organic matter each year. Now ... the annual production of organic matter in terrestrial ecosystems (both natural and human controlled) has fallen to only about 130 billion tons. Some of the reasons for the decline in productivity are fairly simple and obvious: photosynthesis cannot occur on or under buildings, parking lots, airports, streets or highways." (3) "Green" cars will require an almost identical infrastructure, meaning that this assault on the earth's photosynthetic capacity will continue unabated. Indeed, might even step up a gear, as a perceived clearing up of its act would buy more time for the continued existence of the car. (Tarmac, and other such substances used for paving, are, as the Mundi Club point out, little more than coagulated oil slicks. These substances are products of levels of the catalytic crocker process in the same way that oil is. They underwrite oil production - make it an economically viable enterprise when otherwise it would not be; for while "the oil industry is mainly interested in gasoline production and profits ... refineries must run at high utilisation of capacity to be efficient and profitable. Refineries must produce great quantities of asphalt and various chemicals which must go somewhere ... Thus asphalt and herbicides are spread about the land making it possible for refineries to function ... near full throttle." (4) The advocates of a "fossil free energy strategy" would undoubtedly not accept an accompanying end to paving, one of the logical consequences of that strategy. The production of tarmac, etc. and the production of oil are interdependent parts of "refinery opera-

every aspect of the problem itself. Only a planetary revolutionary transformation from the ground up - a revolution now fragmentarily glimpsed in aspects of the radical fringe of the ecology movement, in the indigenous-primitive revival, in anti-authoritarian movements and the new social movements against mass technics, toxics and development - could bring the death train to a halt before it disintegrates and finally explodes under its own inertia.

That revolution remains beyond our reach. Our revolutionary desire must squarely face the fact that disaster itself tends to fuel the system that generates it, which means that we must abandon the pathetic hope that perhaps this latest horror will be the signal that turns the tide (as Chernobyl was supposed to be, and Bhopal). In "Where the Wasteland Ends" (1972), Theodore Roszak points to "the great paradox of the technological mystique: its remarkable ability to grow strong by virtue of chronic failure. While the treachery of our technology may provide many occasions for disenchantment, the sum total of failures has the effect of increasing our dependence on technical expertise."

That economic and technological spheres are one is confirmed in the way capital rushes into the vacuum momentarily caused by its own crisis, renewing operations and finding new ways to expand and reinforce its global work machine. Thus even the oil spill became good for business once crisis management was functioning, as Exxon took tax breaks, raised prices, and took charge of the "cleanup". Valdez and other towns boomed again as thousands of people and hundreds of vessels and aircraft were hired. (Boom towns quickly folded into a shambles when the company closed its operations, but by then investment had already moved on.) San Diego, where the

ship was moved for repairs, also enjoyed its 25 million dollar mini-boom. Other spin-offs included the companies developing new cleanup techniques, scientific organisations doing new studies on the after-effects, (Praise the Lord and Pass the Research Grant) and public relations.

And extraction continues, with exploration now underway in Alaska's Bristol Bay and Chukchi Sea, and drilling platforms operating just off the coast of the ostensibly "protected" Arctic National Wildlife Refuge. (5) After the repair, the Valdez will even be given a new name according to an Exxon executive, so that the ship can "start a new career". The natural world reels, but the business of business marches on.

Because they are isolated, localise events, or because they are generalised, global ones, the calamities of industrialism erode the common conditions of life without necessarily posing any alternatives. Local communities affected by disasters are forced into rearguard, defensive struggles while having to survive under severely deteriorated conditions. Other communities, not directly affected go on with "normal life", holding out a faint hope that the oil, toxic cloud, contaminated water, etc, won't drift in their direction.

The growing awareness of wide ranging catastrophic conditions is insufficient to bring about a response as long as the structures of daily urban-industrial-consumption life are not materially challenged. When they separately confront the various manifestations of the crisis communities are left on the terrain of emergency response, demands for technological and regulatory reform, and ultimately, "treatment", of an increasingly denuded world. That is to say, we remain on the terrain of a system that thrives on disaster, grasping at measures that m

... ever produced worldwide (is) either still in use, in storage or (has) been deposited into landfills." (39). If this vast stockpile, or even a portion of it were "permitted to leak into the marine environment, then the extinction of marine mammals is inevitable." (40) This kind of information would tend to reinforce the Heidelberg Institute's concern for the often neglected issues of production and disposal of cars, as opposed to questions of exhaust emissions during their working lives.

As André Gorz says, "Above all, never make transportation an issue by itself. Always connect it to the problem of the city, of the social division of labour, and to the way this compartmentalises the many dimensions of life." (41) According to Gorz, "in order for people to be able to give up their cars, it won't be enough to offer them more comfortable mass transportation. They will have to be able to do without transportation altogether because they'll feel at home in their neighbourhoods, their community, their human-sized cities ... The car would no longer be a necessity. Everything will have changed: the world, life, people." (41) To take any other approach to the problem of the car, to treat it in isolation from the social forces it produces, and is produced by, is to play into the hands of those with a vested

interest in the survival of the present, ecological, social order, letting them off the hook.

While there is some resistance from the car manufacturers to a shift from petrol as a fuel (42), at heart most of them recognise that electric vehicles and the like represent the last, best hope for the continuance of the car and its economy. Jürgen Hubbert, chief of Mercedes-Benz's passenger car division, says that "Entering the electric car scene is an absolute necessity. We cannot afford not to be present if electric vehicles suddenly take off." (43) This is why "at a time when thousands of people in the car industry have been laid off, annual expenditure on developing electric vehicles (EVs) exceeds \$5 billion worldwide." (43)

The pitfalls of the single issue emphasis are illustrated by Greenpeace Germany's efforts to design their own fuel-efficient vehicle. (44) Here, because of a failure to challenge the dominant paradigm, they end up acting as auxiliaries to the car industry, supplementing the huge research & development programme described above for free, thereby assisting the industry in its bid to ensure its own survival. (Footnotes at end of pamphlet)

tions, and of the petrochemical economy - without one, you cannot have the other. So how will they square this circle - do their proposals actually require a continuation of that petrochemical economy that we've come to know and love?

Fourth, the car's contribution to the supply side of the carbon cycle is not even examined properly - looking no further than the exhaust pipe obscures other, more significant impacts. The Heidelberg Environment and Forecasting Institute, in the first ever 'cradle to the grave' assessment of the car, concluded that its 'birth' (production) and 'death' (disposal) incurred far more ecological costs than its working life. "It is ownership as well as use that is the problem of the car and a car used sensitively (if that is possible) is still a problem for energy, pollution, space and waste." (5) The accuracy of this assessment becomes abundantly clear when you consider the sheer variety and volume of materials involved in car production - "20% of all steel, 10% of all aluminium, 7% of all copper, 13% of all nickel, 35% of all zinc, 50% of all lead, 60% of all natural rubber" (6) and "10% of OECD plastics production" (7) - all major manufacturing processes, all with attendant environmental costs. Such costs would continue to arise from electric vehicles (EVs) - with some new ones thrown in: "Researchers at Carnegie Mellon University in Pittsburgh warn ... that the production and recycling of large numbers of batteries for the vehicles would release dangerous levels of lead into the environment (ironic, given the outcry over the need to reduce lead in fuel) ... the mining and smelting required to manufacture their batteries produce lead emissions which can cause brain damage to young children, and coma and death at high levels of exposure. The researchers argue that even with efficient batteries an electric vehicle would indirectly produce six times more lead emissions than a small car using leaded petrol." (8) Since EVs require more batteries than conventional vehicles (9), and their batteries have a shorter lifespan (10), the issue of disposal becomes even more

pressing. Given that the introduction of EVs is not envisaged as taking place in tandem with a change to the world economic order, the need to dispose of their batteries will only lead to an intensification of 'toxic waste imperialism', an already serious problem. It will mean an expansion of plants such as IMIL, Indonesia's largest importer of lead acid batteries, which "burns 60,000 tonnes (of them) each year, sending clouds of smoke and ash over adjacent icefields. The local people say that ash from the factory often falls into their wells and onto their food. The effluent from the plant is highly acidic. The waste from the IMIL furnace, a mixture of lead and plastic, is dumped outside the factory gates and taken home by villagers who melt it down in woks over open fires in their backyards to sell the extracted lead. Half of the villagers cough blood. Lead levels in IMIL workers and local villagers are between two and three times greater than the acceptable Indonesian occupational health standards." (11)

The more general objections to the proposition that a move away from fossil fuels will serve as a panacea for the problem of the car are outlined above - but there are a whole host of other, more specific ramifications of car use that will not be alleviated in the slightest by a simple change in fuel type. Some of these are listed below:

1) The grim statistics of roadkill (both human and animal) would pile on, as before. (12)

2) Habitat fragmentation - "Roads (and related developments) can divide habitats creating a size that is below an acceptable threshold for survival of particular species, and can form an ecological barrier preventing movement between areas." (13)

3) What might be termed 'social pollution', or '(human) habitat fragmentation' - as aptly described in Donald Appleyard's excellent research (14) Cars also serve to divide people, accentuating, and in some cases creating, the social inequalities between them. Helena Norberg-Hodge was in a unique position

to observe the impact of development - in this case, on the remote region of Lodakh - since she was present both before and after the area began to be opened up to the world economy in 1975. The car was foremost among the 'trappings of modernisation' that began to make an appearance - and in her opinion, "The Lodakh who goes zooming past in a car leaves the pedestrian behind in the dust, both physically and psychologically ... Lobzang was a government driver. When he retired, he bought a jeep and brought it back with him to his village. In the summer he used it to ferry tourists to the monasteries, and the rest of the year he drove his neighbors to and from Leth, for a fee. As a result, his relationship with the other villagers began to change - he now had something the others did not, and was no longer quite one of them." (15) A similar situation pertains with the carless in our society - perhaps even more so, since the car is for more the 'norm' for us.

4) In a related point to 3), the car exercises a tyranny over space, displacing people and preventing the area that it monopolises from being put to other, more productive and convivial uses. "Germany's cars, if one includes driving and parking requirements, commandeer 3,700sq. km of land - 60% more than is allocated to housing." (16)

5) The car and roads help to consolidate the territories of the nation state: binding remote regions on the periphery firmly to the core, facilitating the suppression of troublesome separatist movements or feeling, and locking the many disparate parts of the country into a national and international economic/cultural entity. Roads are one of the main vectors for what former Brazilian Environment Secretary Jose Lutzenberger called 'the virus of industrialism'. Examples abound - the Transamerican Highway (17), the Transition Highway (18), Europe's TERNs (19) and the "7300-kilometre motorway hugging the coast from Tobruk to Senegal ... planned for North Africa, with a fixed link across the Strait of Gibraltar to

connect Europe to a new African motorway system." (20) It is also instructive to note that in the US "there are eight times as many roads in (the) National Forests as there are in the Interstate Highway System." (21) While these areas have been singled out for special attention partly to bring them into the realm of the economy (by commodifying them into timber), there also seems to be some psychological imperative at work, to 'tame the wild', to leave the stamp of civilization upon it - to properly assimilate it into the territory of the nation state in question. Until it is commodified or developed it is still 'terra incognita', the domain of 'these dragons'. ("The word 'forest' in its original and most extended sense, implied a tract of land lying out (foras), that is, rejected, as of no value, in the first distribution of property." (22).)

6) Roads interfere with the water table and drainage patterns. "Because water runs immediately off pavement rather than soaking into the ground, roads often lower groundwater tables and destabilise nearby waterways. In heavily paved areas, streams fluctuate between extreme drought and flood and, in the process, scour away stream banks and fish habitats such as pools and drowned logs. Studies in the Seattle area show that stream channel stability, fish habitat quality, and salmon and amphibian populations all decline if even 10-15% of a watershed is covered by impervious surfaces." (23)

7) The knock-on effects of road building must also be considered - foremost of which is quarrying for roadstone - 43% of the rock aggregates quarried in England and Wales is used for road construction and maintenance." (24) In the UK there is the related issue of over 650 loose 'Interim Development Orders' for quarrying, granted just after the Second World War and threatening some of the best wildlife sites in the country - including 56 SSSIs. (25)

8) Noise pollution: In much of the British countryside it is becoming increasingly difficult to find areas free of the incessant background hum of traffic

noise. According to the CPRE, "The southeast has faced the worst. Over two-thirds of the region was (defined as) tranquil in 1960, but by 1992 these areas had become fragmented by motorways and increasingly noisy roads, and reduced to under half the area." (26) This can have serious implications for non-human species as well - for example, "Road traffic noise has been found to reduce the breeding success of lapwings and redshank for distances of up to 1.5km from large highways." (27) As usual, it would appear that this picture is going to get worse, because increases in traffic are expected to hit the countryside hardest. "The Transport Studies Unit predicts that, while overall traffic may grow by between 83% and 142% by the year 2025 (the DoT's standard figures), the traffic on rural roads may grow by between 127% and 267%." (28) In urban areas, peoples' hearing is worse of age 30 than the hearing of those who live in a car-free environment of age 70. (29)

9) Run-off from roads of heavy metals such as cadmium, zinc, copper, and other substances contaminates soil and groundwater. (30) Tyre rubber abrasion products have a wide range of effects on human health (31), and are similar to, although probably not as lethal as, the tiny PM-10 particles given off by diesel vehicles (which are estimated to kill around 10,000 people per year in the UK). (32)

10) I referred earlier to the way in which the (often very significant) impacts of the infrastructure required by cars are usually overlooked. A prime example - and one that fills in the face of the 'fossil free energy strategy's aim of reducing CO2 emissions - is cement production. Road construction (and other car-related development) is obviously responsible for a great deal of the demand for cement - the manufacture of which "divers off enormous quantities of (CO2) ... This happens as limestone, CaCO3, is converted to calcium oxide, CaO, and its decreed CO2 escapes. Heat 1000kilograms of limestone and you release 440 kg of CO2. Assuming that 500

million tonnes of limestone are used for this purpose each year, then more than 220 million tonnes of CO2 are spewing out into the atmosphere from cement works alone." (33) This example demonstrates the futility of restricting one's analysis to the single question of 'Which car fuel?'. In isolation from the whole complex of other carbon-belching industrial processes of which that fuel is a part, the system evidently requires a thorough overhaul, not the type of palliative measures presented by the proponents of a 'fossil free' energy strategy (frees).

11) Likewise, "One of the major sources of CFCs in the atmosphere is motor vehicle air conditioning. In 1987 approximately 48% of all new cars, trucks and coaches worldwide were equipped with air conditioners. Annually, about 120,000 tonnes of CFCs are used in new vehicles and in servicing air conditioners in older ones. In all these account for around 30% of global demand for CFC11 and CFC12." (34) CFCs, as well as being one of the main culprits for ozone damage, are also a more powerful greenhouse gas than CO2 - consequently, according to the Munich Club, they may well "constitute the biggest single contribution cars make to global warming." (35) Again, what price the 'frees'?

12) It may seem odd to suggest that cars and their disposal (36) potentially pose a bigger threat to the survival of whales than whaling. However, it illustrates the far-reaching and often unexpected ways in which a technology such as the car impinges on the global ecology - and the need for a suitably fundamental and incisive response to the crisis that it has unleashed. The problem comes from polychlorinated biphenyls (PCBs), sometimes described as "the favourite chemical of the postwar age" (37) and now known to be highly toxic for most living beings. "Environmental PCB pollution has been most frequently associated with the manufacture of such electrical equipment as transformers and capacitors, and with automobile manufacture." (38) While production of PCBs is now declining, "65% of the total volume